



Fisher information as a metric of locally optimal processing and stochastic resonance

Submitted by Emmanuel Lemoine on Thu, 01/30/2014 - 14:35

Titre	Fisher information as a metric of locally optimal processing and stochastic resonance
Type de publication	Article de revue
Auteur	Duan, Fabing [1], Chapeau-Blondeau, François [2], Abbott, Derek [3]
Editeur	Public Library of Science
Type	Article scientifique dans une revue à comité de lecture
Année	2012
Langue	Anglais
Date	2012
Volume	7(4): e34282
Titre de la revue	PloS one
Résumé en anglais	<p>The origins of Fisher information are in its use as a performance measure for parametric estimation. We augment this and show that the Fisher information can characterize the performance in several other significant signal processing operations. For processing of a weak signal in additive white noise, we demonstrate that the Fisher information determines (i) the maximum output signal-to-noise ratio for a periodic signal; (ii) the optimum asymptotic efficacy for signal detection; (iii) the best cross-correlation coefficient for signal transmission; and (iv) the minimum mean square error of an unbiased estimator. This unifying picture, via inequalities on the Fisher information, is used to establish conditions where improvement by noise through stochastic resonance is feasible or not.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua1433 [4]
DOI	10.1371/journal.pone.0034282 [5]
Lien vers le document	http://dx.doi.org/10.1371/journal.pone.0034282 [5]

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- [2] <http://okina.univ-angers.fr/f.chapeau/publications>
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=1973](http://okina.univ-angers.fr/publications?f[author]=1973)
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- [5] <http://dx.doi.org/10.1371/journal.pone.0034282>

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